**Abstract for the**
**Township Wetland Density Map**
**by Playa Lakes Joint Venture**

**Purpose:** The purpose of this map is to provide wind industry professionals, and others interested in the conservation of birds, insight into where development of wind farms and their associated infrastructure may have negative impacts on birds inhabiting and using wetlands. Wind industry professionals and consultants should always contact and seek recommendations from statutorily responsible state and federal natural resource agencies prior to finalizing wind power development and mitigation plans, since site-specific conditions may vary.

**Description:** This map highlights townships, 36mi$^2$ parcels of land as defined by the Public Land Survey System (PLSS), across the Shortgrass and Mixed-grass Prairie Bird Conservation Regions that have high densities of wetlands. Wetlands are a vital resource for many birds but water is a limited and often scarce resource in this region. Wetlands receive heavy bird use, especially during migration seasons when they serve as essential stop-over sites for migrating birds. Placement of wind turbines, power lines, and other structures associated with wind energy development near wetlands may introduce collision risks for birds flying in and out of wetlands. This map serves to help identify townships where such risks may be greatest. We highlight townships because land management activities, including design and development of municipal infrastructure such as roads and power lines as well as landownership boundaries, are often based on the layout of the PLSS. Additionally, highlighting wetland densities of townships indirectly identifies wetlands complexes whose conservation may offer more benefit to birds rather identifying single wetlands. We included river channels and wetlands associated with riparian zones, such as wet meadow, in our analysis to encapsulate all water resources available to birds in this region (see Methods for a list of all types).

**Methods:**

- Wetland Density Criteria – We considered a township as having a high wetland density if more than 2% of its area was covered by wetlands (about 460 acres). A township is about 36mi$^2$ in size (about 23,000 acres or 9,324 hectares). Only 20% of all townships in the region have a wetland density greater than 2%. The mean wetland density of townships in the region is about 1.4%. Townships with a wetland density greater that 5% were highlighted to show townships of even greater density. Only 6% of townships had a density greater than 5%. Wetland types included in this analysis are: playas, reservoirs, lakes, ponds, rainwater basins, sandhills wetlands, saline lakes, lagoons, and stock ponds as well as river channels and wetland types associated with riparian zones, such as wet meadow.
- Spatial Analysis – We conducted a simple spatial analysis in a Geographic Information System (GIS) in ERSI ArcMap (ESRI 2005) to determine the density of wetlands in each township. We calculated the total acres of wetland in a township and divided it by the total acreage of the township.
- Wetlands Data – Spatial data of wetlands were derived from a seamless landcover layer developed by Playa Lakes Joint Venture (PLJV). This landcover layer

cross-walks existing landcover layers (e.g., state-based GAP landcover layers) from Nebraska, Colorado, Kansas, Oklahoma, New Mexico and Texas into a single landcover classification system such that landcover types are consistent across state boundaries. To improve the representation of water features in the landcover, in particular playas, PLJV incorporated hydrological data sets including the National Wetlands Inventory (NWI), National Hydrography Dataset (NHD), and playa lakes layers developed via a combination of remote sensing of imagery and interpretation of soils data from the Soil Survey Geographic Database (SSURGO). Detailed information on the development of the PLJV landcover including hydrologic data sources are documented in the Habitat Assessment Procedures Manual (Playa Lakes Joint Venture 2008).

**Limitations:** The data illustrated in this map are limited by the quality of their underlying source data. An accuracy assessment of the PLJV landcover has not yet been conducted so its accuracy is unknown; however, information on the accuracy of the source data for the PLJV landcover (e.g., state GAP layers, NWI) is available upon request.

**Restrictions:** This map and the associated data layers are intended as general guidelines to consider when exploring the potential impact of wind energy development on birds using or inhabiting wetlands. PLJV does not promote this map as definitive in locating wetlands or measuring potential impacts from wind energy development. This map may be revised as new and better data or analyses are available. When using this map or its associated data layers, please cite Playa Lakes Joint Venture.

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**Literate Cited**

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